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MORE TERATOLOGICAL FORMS OF TRILLIUM UNDULATUM.

WALTER DEANE.

I HAVE recently received, through the kindness of Mr. Edwin DeMeritte, some more examples of teratology in our common Painted Trillium (*Trillium undulatum* Willd.) from Holderness, New Hampshire. A specimen of this species, illustrating this curious modification, was collected in August, 1907, by Mr. DeMeritte, in the same locality, and it formed the basis of an article, which I published some months ago (RHODORA, x. 21–24). The locality, as I described before, is on the shore of Squam Lake "in the leaf-mould and scanty soil on a rocky ridge" near the water.

It was in early July that Mr. DeMeritte visited and collected the plant for the second time. On the very same spot as before, and one stem at least evidently from the same rootstock as the plant of 1907, there were five stalks growing in a close cluster, three of them with three whorls of three leaves each, one with two whorls of three leaves

each, and one with four whorls of three leaves. Two of these specimens were collected. It is significant that the plan of three was followed each year. About two meters from this spot was a single stalk with one whorl of four leaves. This specimen was also taken and the three plants were pressed and given to me for study. Perfectly normal types grew in abundance near by. It was intended to revisit the station while the plants were still in flower, but this was impossible. The fruit in my specimens was beginning to develop and the petals were withered. The persistency, however, of the stamens as well as the petals in Trillium has enabled me to make an accurate examination of the floral envelopes.

I will now describe the three specimens. There is one bearing two whorls of three leaves each, the leaves all taper-pointed and those of the lowest whorl broadly ovate with petioles, 2.5 cm. long. The blades are respectively 16 cm., 14 cm., and 14.5 cm. in length. The internode above is 2.5 cm. long. The leaves of the next whorl are broadly ovate with petioles, 1 cm. long. The blades are 11 cm., 13 cm., and 12.5 cm. in length. Above this is the flower with a peduncle, 5.5 cm. long. The sepals are ovate, taper-pointed, sessile, and of extraordinary size, being 4 cm. wide and 9 cm. long. Indeed they resemble typical leaves. There are four petals of normal shape in this specimen, alternating with the sepals, two of the petals being contiguous and doubtless the result of chorisis. These replace the third petal normally present. There are but three stamens, one at the base of each of three of the petals, and all normal. The ovary has two main styles, the division between them extending to the base, one of the styles being cleft half way down, thus making three styles in all. The ovary is one-celled with two parietal placentae, bearing respectively 5 and 3 developing ovules.

This specimen is probably from the same stock as the one of 1907. Closely contiguous to it is the second stalk which has three whorls of three leaves each, all taper-pointed. In the lowest whorl the petioles are 7 cm. long. The blades of two of the leaves have been destroyed, but the third is present and is broadly ovate and 13.5 cm. long. The internode above is 7.5 cm. in length. In the next whorl one leaf is gone, the scar showing its position. The remaining two have petioles 2.5 cm. long and blades 12 cm. in length. The next internode is 4.5 cm. long and the leaves in the third and uppermost whorl are sessile and 10.3 cm., 10 cm., and 11 cm. in length respectively. The peduncle is 1.5 cm. long and there are three large sepals, 5 cm. long,

each with a normal stamen at the base. The three petals, which are also normal, are persistent and withered and have no stamens opposite them. It will be noticed that in this flower it is the outer row of stamens that were developed, whereas in the former flower it was the inner row (those opposite the petals). The ovary has three styles and is one-celled with three parietal placentae, and contains many ovules as yet undeveloped.

The third specimen, which, as I stated above, was growing about two meters from those just described, has a single whorl of four leaves at the top of the stem, broadly ovate and taper-pointed. Three of them have normal petioles 1 cm. long and blades 15 cm., 15 cm., and 14 cm. in length respectively. The fourth leaf has a broadly winged petiole 1 cm. long and blade 15.5 cm. in length. The peduncle is 4.5 cm. long and there are four sepals of normal size 3 cm. long, each with a typical stamen at the base. Three petals only, normal, each with a typical stamen at its base, are present. The ovary has four styles and was plainly four-celled, the partitions separating three of the cells having been broken away by the enlarging ovules, one of the cells being intact. The ovary was filled with forty-six well developing ovules that bade fair to be good seeds. These three specimens with the dissected parts are in my herbarium.

Mr. C. H. Knowlton has kindly sent to me for examination an abnormal *Trillium undulatum*, collected by him in July, 1897, at Farmington, Maine. The plant is just past the flowering stage. A single whorl of four leaves crowns the top of the stem. They are perfectly normal in shape and from 7.5 cm. to 9 cm. in length. The peduncle, two sepals, and three petals are normal, one sepal having evidently been destroyed by an insect. There are six stamens, five of them typical and one more or less petaloid and occupying the place opposite the missing sepal. The ovary has three styles and is one-celled with three parietal placentae, the cell well filled with ovules.

Teratological forms of Trillium seem to be unusually vigorous, and two at least of the specimens that I have just described would evidently have set well developed fruit. I draw no deductions from these statements, but think it best to put on record facts for future specialists.

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